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Products, Processes and Incomes: Cotton Clothing in India

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Summary. – This analysis seeks to relate the processes of different production modes to product characteristics and incomes of consumers within a particular industry. A dynamic interpretation of the cross-sectional relationships suggests that with rising incomes consumers pass through the product and process characteristics of the earliest pre-capitalist formations to those of successively later periods.

1. *INTRODUCTION*

Developing countries are characterized by the co-existence of forms of production which originate in entirely different historical periods. A significant proportion of the production structures of these economies comprises production modes which belong to the period of pre-capitalist economic formations. In this period 'the greater part of the products are produced for the satisfaction of the immediate needs of the community not as commodities',[1] in contrast to the later capitalist mode of production which turns 'the commodities formerly produced as immediate use-values into exchange values'.[2] The genesis of the relationship between products, processes and incomes thus lies in communities where the production mode exists to provide essential commodities for the subsistence requirements of the community. The survival of these earlier modes in developing countries reflects the fact that vast numbers still live at the subsistence level of income and thus require the type of commodity appropriate to that of the earlier period. The organized sector of these economies operates on the basis of imported processes of production developed for the incomes and product requirements of advanced economies.[3] This paper attempts a cross-sectional analysis of the relationship between the processes of different modes of production, the nature of commodities produced and the income levels of consumers in the Indian cotton clothing industry. The cross-section results are interpreted in the light of the historical dynamics of technology in the industry.

2. *The Indian cotton textile industry*

The cotton industry in India was chosen to investigate the relationship for a number of reasons:

a) India has a large proportion (44.5%) of the population below the absolute poverty level of 50 dollars per head.[4] There is consequently a low proportion of wage employment in the economy, and this proportion is lowest in the clothing and footwear industries.[5]

b) The processes of production adopted by the non-wage sector are significantly different from those of the organized sector.

c) The quality of cloth produced by the different sectors provides a useful way of defining the essential intensiveness of the respective commodities.

d) Data are available on both the production and consumption aspects of the industry.

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1. K. Marx, *Capital* (Allen and Unwin, 1946) p. 377.

2. K. Marx, 'Pre-capitalist economic formations', in E. J. Hobsbawm (ed.), *Pre-Capitalist Economic Formations* (Lawrence and Wishart, 1964) p. 116.

3. See F. Stewart 'Technology and employment in LDCs', *World Development* (March 1974).

4. H. Chenery et al., *Redistribution with Growth* (Oxford University Press, 1974) p. 12.

5. Self-employment as a percentage of total employment is 59%.

Table 1. *Processes of production in the hand-loom and mill sectors*

Process	Form of employment	Fixed capital per unit of production Rupees	Working capital per unit of production Rupees	Total productive capital per unit of production Rupees	Total productive capital per employed person
Hand-loom sector					
1) Throwshuttle hand-loom	Self-Employment	5	300	305	243.3
2) Flyshuttle hand-loom	"	40	450	490	392
3) Banaras semi-automatic hand-loom	"	200	1,500	1,700	1,133.3
4) Madanpura semi-automatic hand-loom	"	250	2,250	2,500	1,666.6
Mill sector					
1) Mill non-automatic powerloom	Wage	4,000	6,225	10,225	20,450
2) Mill automatic powerloom	Wage	10,000	7,500	17,500	280,000

Source: K. Prasad, *Technological Choice under Development Planning* (Bombay: Popular Prakashan, 1963), Table 80.

3. *Development of the productive structure*

The spread of commerce 'gave weaving a quantitative and qualitative stimulus which wrenched it out of the form of production hitherto existing'[6] in terms of which production by the peasants for their own use was joined by production for the market. The introduction of machinery gave birth to the mill industry which concentrated in areas near the cotton-growing tracts, near transport, land and power facilities. Some idea of the extent to which the mill industry has developed at the expense of the hand-loom industry can be obtained by considering that the former's share in total output has increased from 43% to 62% between 1909 and the present.

Currently, the industry is divided into three producing groups, namely hand-loom, power-loom and mill producers. The former are invariably self-employed and the latter hire workers on a wage basis. Power-loom producers may operate on a self-employed basis or by employing a fair number of workers under the same shed. The decentralized sector, as it is called (comprising hand-looms and power-looms), produces some 47% of the total output of the industry.[7] Of this, the share of hand-looms is 62.5%. The power-loom sector is in a sense intermediate between hand-looms and mills, comprising as it does mainly small units of four looms and less, with only 5% of the units defined as large in terms of the Industries Act.[8]

4. *Processes of production between sectors*

The processes of production between the sectors are set out in Table 1 above.

It is important for what follows to establish the extent of automatic loomage, the import content of the production processes and their age structure.

As a percentage of the total of looms installed in the mills only 16.3% are automatic.[9] This figure may be compared with the

6. Marx in Hobsbawm, op. cit., p. 134.

7. Government of India, *Draft Fifth Five-Year Plan 1974–79*, p. 160.

8. Government of India, *Indian Worker–An Industry Wise Review* (1969).

9. *India Textile Bulletin* (1968).

comparable figures for Germany, Japan and the United States of 69%, 81% and 100% respectively.[10]

While hand-looms are always produced domestically,[11] of the total looms in mills 76% are imported.[12] But the age structure of the looms implies that the machinery currently in use is that which was designed for much earlier periods in the exporting countries.[13] The average age-composition of the looms is shown in Table 2.

Table 2. *Age-composition of looms*

Pre-1910	1910–25	Post 1925
57.3	20.7	28.0

Source: Dharma Kumar, S. P. Nag and L. S. Venkataramanan, *Resource Allocation in the Cotton Textile Industry* (Asia Publishing House, 1965) p. 93.

The differential productivities and labour requirements per loom are shown in Table 3 for four of the five processes shown in Table 1.

Having established the extent and nature of the respective production processes we turn now to an examination of the nature of the products produced and thereafter to the income classes of consumers of such products.

5. *The nature of products*

The nature of products in terms of colour, size, cloth, embroidery produced by the various sectors is so varied that it is almost impossible to generalize. The question may, however, be approached by comparing the nature of products produced by the hand-loom sector in terms of their quality (i.e. in terms of counts of yarn) with those of the mill sector.

The two basic items of dhoties and sarees comprise some 52% of total hand-loom products, though these can vary enormously in price depending on the quality. This is shown in Table 4 (*overleaf*) for hand-loom produced dhoties of the same width and length.

Compared with the mill sector, hand-loom production is concentrated in the highest and lowest count ranges, as shown in Table 5. (*overleaf*).

The hand-loom sector has an advantage over the mills in the production of the lowest counts since the cost of yarn as a percentage of total cost is highest in these counts. Thus, 'the margin of cost above the raw material is so small that there is relatively less scope for the economies which attend large-scale production'.[14] As the cloth quality improves, weaving costs as a percentage of total costs rise correspondingly with the greater intricacy of the operation so that at the highest counts hand-loom products may be considered skill- as well as labour-intensive.

10. OECD, *Modern Cotton Industry* (1965).

11. It was found in 1942 that of the total of hand-looms, 64% were throw-shuttle and 35% fly-shuttle. See A.K. Bagchi, *Private Investment in India 1900–1939* (Cambridge University Press, 1972) p. 224.

12. *India Textile Bulletin*, Annual Census (1969).

13. According to Bagchi, 'the technical backwardness of India is dramatically illustrated by the failure of the Indian mill industry to adopt automatic looms or automatic attachments on any large scale', op. cit., p. 255.

14. Prasad, op. cit., p. 123.

Table 3. *Output per loom and labour (shift) per loom*

Process	Output per loom per day	Labour per loom per shift	Number of shifts per day	Labour shift per loom per day
Flyshuttle hand-loom	6	1	1	1
Banaras semi-automatic hand-loom	20	1	1	1
Mill non-automatic power-loom	80	$\frac{1}{2}$	2	1
Mill automatic power-loom	80	$\frac{1}{16}$	2	$\frac{1}{8}$

Source: A. K. Sen, *Choice of Techniques* (Blackwell, 1972) Appendix C.

Table 4. *Prices and qualities of hand-loom dhoties 1970*

Quality of cloth	Width	Length	Rupees per unit
20s/20s	1–27	7–32	11.11
40s/40s	"	"	12.45
60s/60s	"	"	15.64
80s/80s	"	"	19.55
100s/100s	"	"	21.13

Note: The counts of yarn refer to cloth texture with higher counts representing a finer cloth. The *India Textile Bulletin* classifies counts as follows:

Coarse	= Average count yarn less than 17s
Medium B	= Average count yarn between 17s and 25s
Medium A	= Average count yarn between 26s and 34s
Fine	= Average count yarn between 35s and 47s
Superfine	= Average count yarn greater than 48s

Source: *India Textile Bulletin*, 1972.

Table 5. *Percentage distribution of counts of yarn consumed by mills and hand-looms*

Counts	Mills	Hand-looms
1s–10s	8.1	20.0
11s–20s	49.6	34.4
21s–30s	25.7	19.6
31s–40s	11.6	14.2
>40s	5.0	11.8
	100	100

Source: *Report of the Fact Finding Committee*, 1942.

Competition between the sectors has taken place largely in clothing of medium counts in which mills can take advantage of scale economies since the proportion of cost above the raw material cost is proportionately higher than that in the lowest counts.[15] Production by mills of the coarse variety is still relatively unimportant as recent figures show.

While it has been found that different counts influence the type of machinery required,[16] there is no precise specification of this relationship. One may, however, postulate that the mills producing the coarser varieties use more dated and thus more labour-intensive processes of production. Some evidence for this is suggested by the fact that the more prosperous mills which are able to diversify their production, possess the modern finishing and processing equipment necessary for the production of more sophisticated products.[17] The only automatic looms in existence in 1930 produced mainly 'high-class cotton suitings as well made as any in the country'.[18]

6. *Relative prices*

Data on this question are notoriously scarce. The Textile Enquiry Committee of 1958 noted that 'there is no organization which can throw sufficient and reliable light on what is happening at the consumer's end in regard to the consumption of cloth and price trend'.[19] Indices of prices of mill and hand-loom products are available but are of no use for comparing absolute prices, while it is very difficult to make any precise comparison between two

15. This perhaps explains why the controlled cloth scheme instituted in 1964 has been such a failure. The scheme was designed to ensure that a part of the mill output would be of varieties used by the relatively poor and would be sold at prices they could afford. Instead of encouraging the production of coarse varieties the effect was to divert the output of the mills away from these varieties. See *Economic and Political Weekly*, Vol. IX, No. 37 (14 September 1974).

16. National Council of Applied Economic Research, *Demand for Cotton Textile Machinery* (New Delhi, 1967).

17. Kumar et al., op. cit.

18. Quoted in Bagchi, op. cit., p. 255.

19. Government of India, *Report of the Textile Enquiry Committee* (1958) p. 12.

Table 6. *Percentage distribution by counts of mill-made clothing*

State	Coarse	Medium B	Medium A	Fine	Superfine	TOTAL
Andra Pradesh	22.1	45.2	31.4	–	.5	100%
Kerala	6.6	69.3	24.1	–	–	100%
Mysore	15.8	39.9	35.8	4.5	4.0	100%
Orissa	10.6	28.7	52.2	5.6	2.8	100%
Uttar Pradesh	12.5	69.1	17.4	.1	.9	100%
All India	16.0	32.5	42.2	3.8	4.6	100%

Source: Calculated from various issues of the *India Textile Bulletin*.

products which are differentiated in so many respects. Nevertheless, the broad picture appears to be that while hand-loom products are in general more expensive than the most comparable mill garments,[20] the former are still capable of producing the very cheapest products made of the coarsest cloth with dull colouring. In a study of cotton clothing in Poona, for example, Brahme found that hand-looms produced the very cheapest sarees which were purchased by women belonging to the 'Depressed Class'.[21] Another study of Madras found that villagers preferred hand-loom products on the basis of their cheapness and durability.[22]

Ideally, a comparison of relative prices of the products of the two sectors should take place in a situation in which the operative conditions are identical so that price differentials can be attributed to the respective technologies. In reality, however, although hand-loom producers are discriminated against in terms of raw material prices, availability of yarn, interest rates and so on, they receive substantial assistance from the Government. Prasad has estimated the bias in these conditions against hand-loom producers to be some 30% of the sales price.[23] The Fifth Five-Year Plan points out that these difficulties have by no means been removed. On the other hand, the projected outlay on the hand-loom industry in the Plan amounts to some 18% of the total value of annual output of the industry. Then again, the controlled cloth scheme has attempted to regulate the price and quantity of certain varieties of mill-made cloth. It is thus extremely difficult to disentangle the purely technological element of prevailing price differentials.

7. *Consumption of hand-loom and mill clothing by expenditure classes*

The only source which provides sufficient information to examine the consumption of mill and hand-loom clothing in terms of expenditure classes is the Seventeenth Round of the National Sample Survey, 1961–62.

Except in the highest expenditure classes where woollen and art silk products are purchased, cotton clothing comprises roughly 90% of total expenditure on clothing. In order to establish the labour-intensity of the purchases of the various income and thus expenditure groups, hand-loom, mill-made and khadi-clothing (produced by hand-loom weavers) purchases were summed and each taken as a percentage of the total for rural and urban areas at the all-India level. The results, classified by monthly household expenditure classes are presented in Tables 7, 8 and 9 (*overleaf*).

While no breakdown is available for power-loom products, a study of cotton textile consumption in villages shows the percentage share of the power-loom purchases to be 11% of the total, with hand-loom products and khadi contributing 16% and 3% respectively.[24] The share of hand-looms is slightly higher than the average for rural and urban areas of 13%.

Table 8 shows a significantly higher proportion of hand-loom clothing purchased by consumers in the lowest household expenditure class. The exceptionally high figure of 57% in the first urban class reduces to 28% if hand-loom clothing is taken as a percentage of total clothing (if the latter is defined to include bedding and upholstery) since this class spends some 43% of its total clothing expenditure on this item.

It is only consumers well below the average who consume a higher proportion of hand-loom clothing. The average monthly total per capita expenditure in the first household expenditure class is 8.9 rupees for urban areas and 10.1 for rural areas compared to the average for all classes of 30.9 and 21.7 rupees respectively. The percentage of households covered by this first expenditure class is 3% for urban and 4.2% for rural areas.

The proportion of hand-loom clothing purchased drops sharply after the first expenditure class for both the rural and urban sectors. This cross-sectional result should be seen in terms of the historical relationship between products, processes and incomes discussed above. Production by independent weavers of

20. Prasad, op. cit., p. 307, contains a list of prices of comparable mill and hand-loom products drawn from the available evidence.

21. S. Brahme, *Distribution and Consumption of Cloth in Poona* (1962).

22. 'Consumption pattern study of consumers from Coimbatore District of Madras', reported in *India Textile Bulletin* (1967).

23. Prasad, op. cit. Similarly, Dantwala in *Economic & Political Weekly*, Vol. VII, No. 51 (16 December 1972) argues that 'much of the present non-viability of the production of "inferior" technologies is not entirely due to their inherent inferiority'.

24. Y. K. Alagh, 'Planning policy and the Fifth Plan', *Economic and Political Weekly*, Annual no., Vol. IX, Nos. 6, 7 and 8 (Feb. 1974).

Table 7. *Mill-made clothing as a percentage of the total of mill-made, hand-loom and khadi clothing—classified by monthly household expenditure classes*
Rupees

	0–25	25–50	50–100	100–150	150–300	300+
Rural areas	79.2	82.2	82.9	83.1	88.3	85.8
Urban areas	42.9	84.4	82.4	87.0	83.9	87.0

Source: This table and those that follow have been calculated from the *National Sample Survey* quoted above.

Table 8. *Hand-loom clothing as a percentage of the total of mill-made, hand-loom and khadi clothing—classified by monthly household expenditure classes*
Rupees

	0–25	25–50	50–100	100–150	150–300	300+
Rural areas	20.8	10.8	15.9	15.7	10.3	12.5
Urban areas	57.1	15.6	16.2	12.0	14.1	12.0

Table 9. *Khadi clothing as a percentage of the total of mill-made, hand-loom and khadi clothing—classified by monthly household expenditure classes*
Rupees

	0–25	25–50	50–100	100–150	150–300	300+
Rural areas	–	0	1.2	1.2	1.3	1.1
Urban areas	–	0	1.4	.8	2.0	1.0

Note: Here and in the following tables dashes represent zero estimates.

crude products in the earliest period was partially replaced by machinery with the spread of commerce and rise in incomes. But the age structure of machinery in the industry shows that incomes have not risen sufficiently to generate the demand for more sophisticated products and hence processes. The techniques in existence today were designed in advanced countries for the income levels and demand structure appropriate to the early part of this century. We may thus attempt to dynamize the cross-section results above by arguing that as incomes rise, consumers pass, in effect, from the products and processes of the earliest period to those of progressively later periods.[25] That is to say, they pass from the products and processes of the hand-loom sector to those of the mill sector which become progressively less dated as incomes rise.[26] Technological dualism, then, is not a stark contrast between primitive and advanced products and processes but is rather a continuum of the products and processes of different time periods.

Finally, the results above at the all-India level conceal tremendous regional variations. The regional variations in the proportion of hand-loom products purchased can be obtained from Table 10 on opposite page.

25. Cooper's example of a shift from an ordinary safety razor produced labour-intensively to the consumption of an electric razor produced by highly mechanized methods embodies the same idea. See C. Cooper, 'Choice of techniques and technological change as problems in political economy', *International Social Science Journal*, No. 3 (1973).

26. This is not, of course, strictly true since the highest income groups also consume the intricate and luxury hand-loom products. However as Marx pointed out, luxury items are the least important for technological comparison between different economic epochs.

Table 10. *Proportion of hand-loom clothing to total of mill, hand-loom and khadi clothing—classified by monthly household expenditure classes*

Rupees

	0–25	25–50	50–100	100–150	150–300	300+
Madras						
rural	91.7	58.3	55.7	52.2	26.7	23.2
urban	100	50.0	71.4	29.3	31.7	27.7
Mysore						
rural	–	–	5.7	23.4	8.0	35.0
urban	–	35.7	9.1	16.4	11.7	20.0
Andra Pradesh						
rural	–	16.7	32.7	66.7	28.1	33.6
urban	79.3	0	29.7	20.8	39.0*	21.5
Uttar Pradesh						
rural	–	0	1.1	4.2	2.6	2.1
urban	–	–	6.6	2.3	5.2	5.4
Kerala						
rural	100	59.1	31.5	38.5	11.9	22.4
urban	–	67.3	29.2	16.4	26.5	9.3

8. *Summary and conclusions*

It has been argued that products, processes and incomes are related in each historical period and that the Indian cotton clothing industry reflects a continuum of such relationships. The relationship existing in the pre-capitalist period is reflected in the cross-section data by the mode of production of the hand-loom sector and the higher percentage of its coarse products purchased by the lowest income group. An analysis of the nature of mill products together with the age structure of the machinery suggests the possibility that rising incomes are associated with the product and process characteristics of progressively later periods.

The results have a great deal of relevance for the current concern with income redistribution and employment. Since the bare minimum level of living in India at 1960–61 prices has been defined as 20 and 15 rupees per month[27] for the urban and rural sectors respectively, the results show that an income redistribution aimed at eliminating poverty would, by reducing the hand-loom share of output, substantially reduce employment. This can be seen in terms of an elimination of the lowest household expenditure class in both rural and urban areas. The hand-loom sector is to some extent predicated upon poverty.

This relationship between products, processes and incomes is missed by studies of the employment effects of an income redistribution which not only ignore the self-employed sector but also define products very broadly, i.e. in terms of industries.[28] We have argued that the 'same good' in reality comprises products which are qualitatively different because they are associated with the processes and incomes of different historical periods. It is correspondingly incorrect to speak of 'technological options' of producing the 'same good'.[29]

27. Pranab Bardhan, 'On the incidence of poverty in rural India in the sixties', in T. N. Srinivasan and P. K. Bardhan (eds.), *Poverty and Income Distribution in India* (Indian Statistical Institute, 1974).

28. The methodology of these studies is summarized in W. R. Cline, 'Distribution and development: a survey of literature', *Journal of Development Economics* (Feb. 1975).

29. See V. Tokman, 'Income distribution, technology and employment in developing countries: an application to Ecuador', *Journal of Development Economics* (March 1975).